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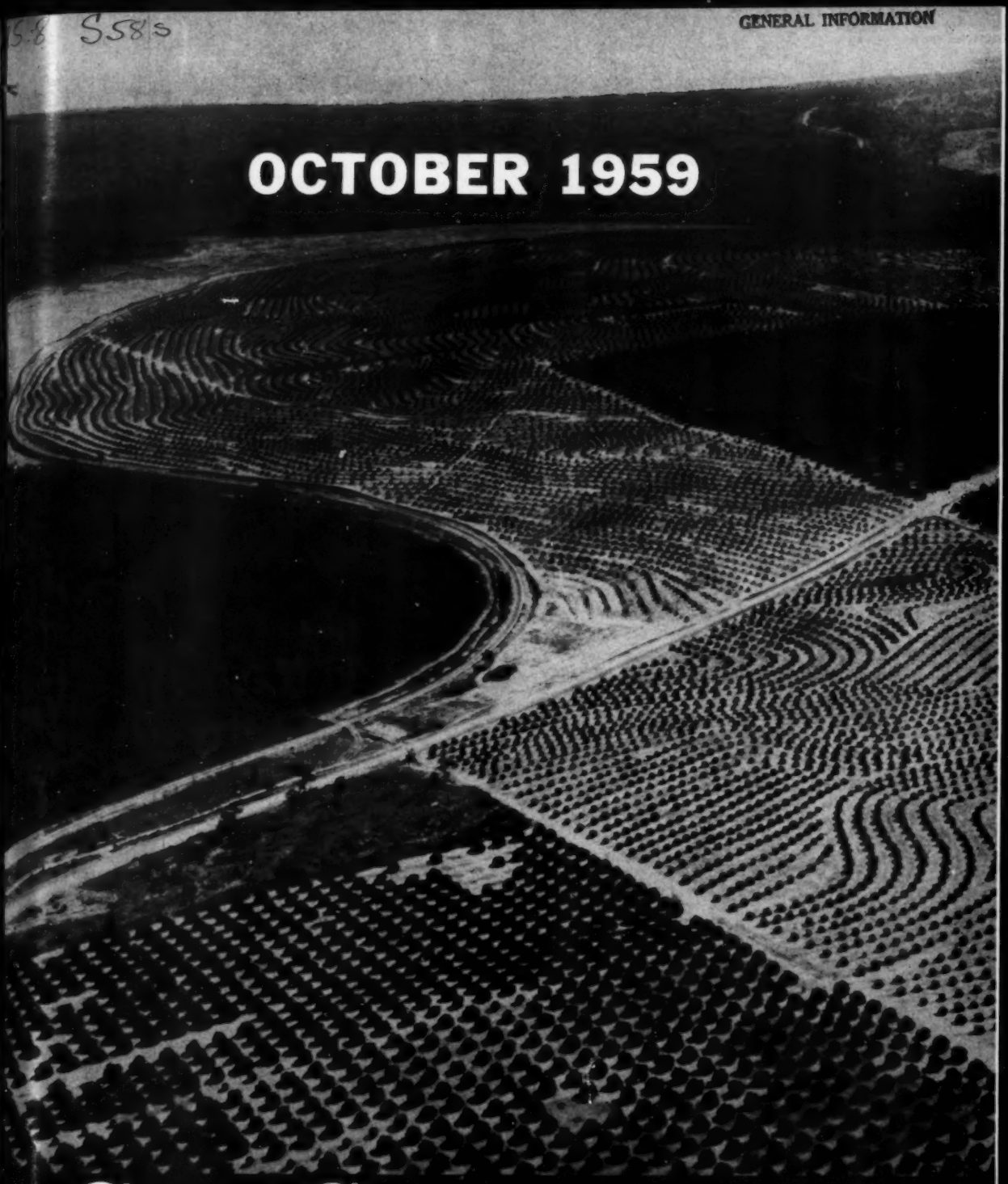

OCTOBER 1959

SOIL CONSERVATION

Soil Conservation Service • U. S. Department of Agriculture

SOIL CONSERVATION

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U. S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

★ THIS MONTH ★

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TOM DALE, Editor

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication has been approved by the Bureau of the Budget, June 26, 1958. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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"THE noblest task that confronts us all today is to leave this country unspotted in honor, and unexhausted in resources. I conceive this task to partake of the highest spirit of patriotism."

On our nation's birthday we might well reflect on these words of Gifford Pinchot written a half century ago. Yet it was only 25 years ago that our country first awakened to the task of keeping our resources from becoming exhausted.

Today we are working to save our soil. In Wisconsin where soil conservation had its beginning, the work moves ahead. There's still more to be done, but the record to date is impressive.

. . . . .

The battle against erosion will continue because our country and its soil are sacred.

People will fight to keep the land green and fertile just as a soldier will fight to keep it free.

—Excerpted from front page editorial in WISCONSIN AGRICULTURALIST of July 4, 1959.

FRONT COVER.—A section of a 420-acre citrus grove, said to be the world's largest grove planted on the contour, in Lake County Soil Conservation District, Florida.

Photo by Elmer Turnage

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Lynn Gulch Has Fewer Gulches

John McBrearty Has 4.5 More Acres, Checks Erosion, and Saves Time and Labor

By NORMAN DONALDSON

JOHN McBREARTY has reclaimed 4.5 acres for pasture and hay and, at the same time, eliminated a severe erosion problem on his land in the Lynn Gulch area north of Pomeroy, Wash.

The 200-acre field with a 25 percent slope had for many years been cut by gullies, some as deep as 10 feet and equally as wide.

Each spring has seen many tons of topsoil washed into and down the gulches. In the spring of 1953, McBrearty, teaming up with the Pomeroy Soil Conservation District and with engineering supplied by the Soil Conservation Service through the local district, set out to do something about the problem.

The SCS technician and McBrearty examined the gullies. McBrearty realized he must follow recommendations exactly if he wanted to be successful in stabilizing the gullies.

A soil survey of the farm indicated that the soil was a deep Walla Walla silt loam. Such soils have a high silt and low clay content. They do not compact readily.

The technician advised McBrearty to use a sheepsfoot roller after each 6-inch layer of fill. This roller was to be one of the keys to success as it packs the soil tighter than the original soil. No stubble brush, or other debris would be used in filling. It was recommended that after the gullies were filled, they should be graded, shaped, and seeded to grass to serve as waterways. A diversion ditch was to be placed at the top of the waterways to divert any sudden runoff from cloudburst or snow melt.

McBrearty hired a bulldozer and operator and rented a sheepsfoot roller from the Pomeroy Soil Conservation District, using his own tractor to pull the roller. Each gully was filled and packed. First, the gully was shaped with the bulldozer so it could be filled in 6-inch layers and packed. This process of filling and packing continued until each gully was filled.

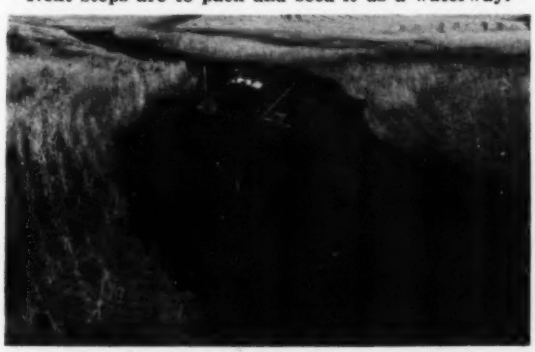
After the gullies had been filled they were graded and shaped. Diversion ditches were built above them as recommended. Then a seedbed was prepared and the waterways were seeded at the rate of 10 pounds to the acre of intermediate wheatgrass. By fall a good cover of grass was established. The waterways came through the winter and spring without being severely damaged.

What McBrearty has gained is a slope uninterrupted by deep gullies. He now can operate at right angles to the slope instead of up and down, as he was forced to do in the past. He not only has eliminated gullies, but also is controlling erosion on the entire field.

His project also has gained several acres of pasture or hay land. The gullies had been a big hazard in his cattle operation. Young and old animals alike had fallen into the gullies to die of broken bones or starvation before being discovered.

In 1958, McBrearty was selected as "Soil Conservation Farmer" for Garfield County. The award was based on the waterway project and the fact that he is continuing to be a conservation farmer.

Bulldozer shapes a gully on the John McBrearty farm. Next steps are to pack and seed it as a waterway.



Note:—The author is soil scientist, Soil Conservation Service, Pomeroy, Wash.

Scientist Makes Water His Servant

by JACK BARRICK

STOP water at its source, use it and reuse it. Then release it slowly to avoid soil erosion. That's a profitable practice as you can learn from Dr. Joseph George Davidson, internationally famous organic chemist, owner of 9,000 acres on picturesque Mount Eqinox, high above Manchester, Vt.

Clear, cool water from mountain rivulets and springs on Mount Equinox follows a winding course before it reaches the valley below. Dr. Davidson puts it to work on its way down the rugged slopes.

Hydroelectricity, water supply, sediment reduction, flood prevention, and preservation of the natural beauty of the majestic mountain are Dr. Davidson's objectives.

Dr. Davidson, president of the Connecticut River Watershed Council and former vice president of a large company, has led a busy life. A long list of corporate responsibilities and unusual creative works in the field of vinyl plastics have distinquished the energetic scientist.

Dr. and Mrs. Davidson first saw Mount Equinox on a Vermont tour in 1939. They were seeking a place to develop their project. The quiet and serenity of the Vermont countryside appealed to them.

The Davidsons bought 2,000 acres on the mountain that year. They added 7,000 acres of the mountainside to their holdings after it appeared certain that all of their expectations could be fulfilled.

Now, 20 years later, the Davidsons have everything as they had planned. Even their inn, unique for its plastic walls, ceiling, and furnishings, rests at the top of the lofty peak, 3,800 feet above sea level. Dr. Davidson's earlier mental picture became a reality in Barbo's Lake and Lake Madeleine in 1957.

The manmade lakes, cradled on the steep slopes, store water for generating electricity with Pelton wheel turbines housed farther down the mountain. Heavy runoff from melting snow loses its destructive energy upon flowing into the lakes. It accumulates in the basins for later release through a steel pipeline, called a penstock, down the mountain to the generators.

Lake Madeleine, largest of the reservoirs, is a high point in Dr. Davidson's long-range plans. It has a storage capacity of 200 million gallons of water. Two earthen dams, built across either end of what had been a swampy divide, form the 35 acre lake. At spillway level the water is 70 feet deep.

Lake Madeleine, named for Mrs. Davidson, is 2,200 feet above sea level. It stores water during spring thaws and at times of flash floods. Dr. Davidson wanted to impound water at the highest practicable point. He has also provided a way to pump water back up the penstock to Lake Madeleine from another reservoir—called Hopper Pond. Back pumping will be done only when the water level in Lake Madeleine is below

At top is pictured Sky Line Drive on Mount Equinox. Lakes Madeleine and Barbo are in left center.

Note:—The author is State soil conservationist, Soil Conservation Service, Burlington, Vt.

normal, when there is a surplus outflow from Hopper Pond, and when the need for electricity is low.

Dr. Davidson explained that this system utilizes surplus electricity during slack loads to store water for use during peak loads.

Dr. Davidson uses much of the water twice for generating electricity. Water from Lake Madeleine drops 400 feet through a penstock reaching a Pelton wheel at a powerhouse with 180 pounds pressure. Turbine outflow from that wheel flows into Hopper Pond before making a second drop of 750 feet to a Pelton wheel in another powerhouse with 290 pounds pressure. That same water helps regulate streamflow beyond his property line.

The system is automatic. A needle valve regulates the quantity of water surging from penstock against cups of the Pelton wheel. The valve opens wider as electrical load increases, sending additional water to maintain the generator at constant speed. The valve opening lessens when the electrical load decreases.

Doctor Davidson provides the Civil Aeronautics Administration with electric power to operate communication towers at the summit of Mount Equinox. Thousands of tourists seek thrills and scenic views in driving up Equinox Sky Line Drive, a 6½-mile climb on a paved highway that he engineered and built.

Lake Madeleine is in effect a flood prevention reservoir, too. It traps runoff from a 1,300 acre watershed for release later through the penstock. Water is deepest following spring thaws. Water rose within 4 feet of the principal spillway last spring. Its lowest level follows the late summer and fall tourist season when much electricity is used to heat the inn and other buildings on the mountain. The doctor doesn't expect outflow through the emergency spillway often.

Barbo's Lake, second in size, covers 8 acres. It has a fairly uniform depth of 10 feet. Its discharge supplements smaller Hopper Pond when additional water is needed to spin turbines in the lower powerhouse.

Soil-holding sod protects the earthen dams. Deer, in two's and three's, feed on the lush grass that surrounds the lakes. Rip-rap prevents shore erosion.

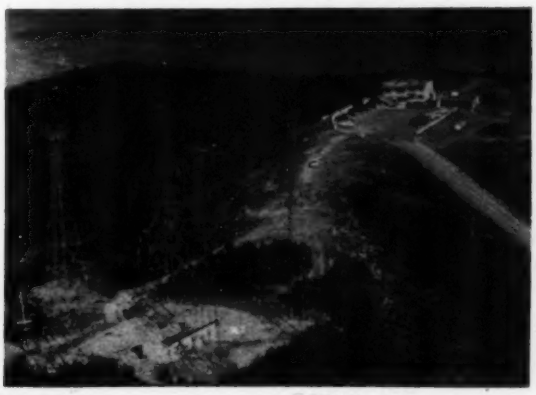
Doctor Davidson said that trees best protect the steep watersheds above his lakes from soil erosion. He doesn't plan to cut them soon. He's content to have the dense foliage and deep, intertwining roots to hold his mountain soil securely. His long-range plans include cutting mature trees on a selective basis.

While Dr. and Mrs. Davidson first sought only a place in the country to work at their project and later expanded far beyond their original intentions, they continue to find serious challenges on the mountain.

Doctor Davidson is frank to admit that his intense interest in developing soil and water resources on Mount Equinox has carried him too far to quit now. But he is quick to add that he and Mrs. Davidson love it and they are looking forward to many more years at developing soil and water resources on Mount Equinox, using modern techniques.

Lake Madeleine, half full when this picture was taken, drops water 400 feet to turbine.

The inn on summit of Mount Equinox at end of the drive with CAA towers at left.



WATER IN THE SOUTHWEST

Research seeks answer to when, how much, where it goes, what for, and why.

By R. V. KEPPEL and J. E. FLETCHER

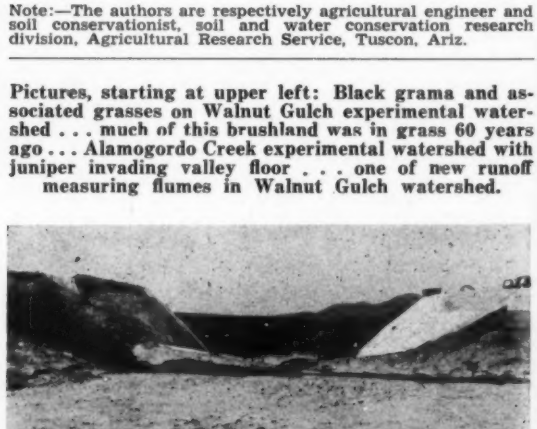
Approximately half a million square miles in the Southwestern United States are in the arid and semiarid climatic zones. The principal use of this vast area is for livestock grazing.

Water yields from the area are generally low and constitute only a small portion of the water supplies for irrigation. On the other hand, a major part of the sediment entering irrigation reservoirs comes from rangeland. During recent years municipal, industrial, and irrigation users have made increasing demands on the limited water resources of the Southwest.

Downstream water users fear that vegetative improvement on rangelands as a result of soil conservation programs may reduce the already pitifully small water yields of these areas. Ranchers operating the land quite naturally are interested in maximum forage production. They feel that any rain falling on the land is theirs to use to their best advantage.

Note:—The authors are respectively agricultural engineer and soil conservationist, soil and water conservation research division, Agricultural Research Service, Tuscon, Ariz.

Pictures, starting at upper left: Black grama and associated grasses on Walnut Gulch experimental watershed . . . much of this brushland was in grass 60 years ago . . . Alamogordo Creek experimental watershed with juniper invading valley floor . . . one of new runoff measuring flumes in Walnut Gulch watershed.



In an effort to provide basic hydrologic data necessary for the intelligent management of these rangelands, the Agricultural Research Service, in cooperation with the Soil Conservation Service and the State agricultural experiment stations, is conducting watershed research in Arizona and New Mexico. The studies were begun by the research division of the SCS in 1953 and have been continued by the ARS since 1954.

Some of the questions which the research studies are designed to answer are:

(1) What are the important runoff-producing characteristics of convectional thundershowers? (2) How much water and sediment are yielded from range watersheds of various sizes under present vegetation and management? (3) How will a range conservation program affect these yields? (4) How much of the runoff water does the channel system lose before water reaches a point of downstream use, and what happens to it?

Two large watersheds have been selected for intensive field study: Walnut Gulch watershed at Tombstone, Ariz., and Alamogordo Creek watershed near Santa Rosa, N. Mex.

The Walnut Gulch watershed includes 60 square miles. In addition to the main watershed, four subwatersheds ranging in size from 0.9 to 43 square miles are gaged. Vegetation is representative of the black gramagrass areas of southern Arizona which have been partially invaded by mixed stands of creosotebush, whitehorn, and tarbush. Comprehensive surveys of soil, vegetation, and range site and condition are essentially complete.

In eastern New Mexico the 67 square mile Alamogordo Creek watershed was selected as representative of the blue gramagrass areas. Vegetation on the level portions of the valley floor consists of blue grama, galleta, and their associates. On the escarpment which rings the valley are found stands of pinon and juniper, which have moved out into the rougher portions of the valley. One measuring flume at the watershed outlet is in operation. Soil and range site and condition surveys are well on their way to completion and detailed sampling of the vegetation is in progress.

One of the unusual features of the hydrology of semiarid lands is the very small area covered by runoff-producing rains. Practically all of the runoff from the watersheds comes in the convectional thundershower season. Recent studies of radar film records indicate that in southern Arizona the average summer thunderstorm diameter is about 1 mile. Several of these small storms may occur more or less simultaneously on one of the large watersheds. Rainfall intensities are typically very high. It is obvious that in order to obtain an accurate picture of the rainfall pattern on a 60 square mile area, a large number of recording raingages are needed. At present time the Walnut Gulch and Alamogordo Creek watersheds have about one gage per square mile. Data from these dense gage networks are yielding important information concerning depth-area-frequency relationships for the unique storm types characteristic of the region.

A distinctive feature of the runoff pattern, which results from the peculiar nature of the runoff-producing storms, is the large channel or transmission loss. Runoff from one or more small thunderstorms on one portion of the watershed may flow through an extensive network of dry channels before reaching the watershed outlet. A significant portion of the runoff water may be absorbed by the coarse textured channel deposits during the flow. Losses as high as 5 acre-feet per mile of channel during a single flow have been estimated on the Walnut Gulch watershed. Whether or not the water lost in the channels ever reaches the permanent ground water table depends on the geology of the area. Preliminary estimates indicate that much of this water is used by the shrubs and trees which flourish along the edge of the channels.

Major problems have been encountered in obtaining accurate flow measurements from the large experimental watersheds. Although the

No. 50

This is the fiftieth of a series of articles to appear from time to time in explanation of the various phases of research being conducted by the Department of Agriculture on problems of soil and water conservation.

channels may be dry as much as 99 percent of the time, the runoff that occurs comes as extremely flashy flows. Flow rates commonly rise from zero to several thousand cubic feet per second in 15 or 20 minutes and recede again to zero in 2 or 3 hours. Steep channel gradients, high velocities and heavy concentrations of sediment further complicate the measurement problem. Based on extensive model testing and on early field experience, new measuring flumes have been developed and are being built in order to overcome such difficulties.

Each of the experimental watersheds has 25 to 30 stock watering ponds. Periodic surveys of these ponds will yield information on sediment inflow rates. In addition, water level recorders are being installed on several of the ponds to measure runoff from small areas of various combinations of soil and vegetation. Where bank erosion is a major source of sediment, periodic channel surveys are made.

Runoff and sediment production are being measured from the watersheds under present conditions of vegetation and management. Meanwhile, cooperative studies with individual ranchers on the watersheds are pointing the way toward economic and effective measures for improvements. The relationships that exist between kinds and amounts of native vegetation present and various soil, climatic, and management factors are being studied in order to shed more light on runoff and sediment problems. When an initial period of calibration has been completed, a concerted effort will be made to apply a comprehensive soil conservation program on the ranches comprising the watersheds, and the effect of this program on water and sediment yields will be evaluated.

In addition to the large watersheds on which water and sediment yield are being studied, seven smaller rangeland watersheds have been under measurement for nearly 20 years. Three are located near Albuquerque, N. Mex. and range from 40 to 180 acres. Four in the vicinity of Safford, Ariz. vary from 520 to 760 acres. Although the soil and vegetation inventories on these areas have not been as complete as on the large watersheds, basic rainfall and runoff data from them are producing valuable information for use in the design of stock ponds and for current flood prevention and upstream control programs. Methods have been devised for synthesizing hydrographs for small arid-land watersheds. The shape of the runoff hydrographs from these areas seems to depend only on certain physiographic features of the watershed. This makes it possible to predict the hydrograph shape for similar ungaged watersheds by evaluating these physiographic features from aerial photos and maps or from reconnaissance surveys. Studies are continuing on the effect of soil, vegetation, and preceding rainfall and runoff on the rainfall-runoff relationship.

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and your future
THE GREAT PLAINS CONSERVATION PROGRAM
. . . special technical help, cost sharing to carry out a complete conservation plan.
U. S. Department of Agriculture

Small exhibits such as this are appearing in windows, lobbies, and offices throughout the Great Plains to help focus attention on the Great Plains Conservation Program. USDA has sent 750 of the 29 by 45 inch, four-color portable exhibits to SCS offices in the 10-State region where the program is in effect.

Mr. "Till" Had a Dream...

It came true in the North Carolina Mountains where he keeps store, farms, and preaches conservation.

By LEON J. SISK

NEARLY everyone has a secret dream. For some it's as heroic as one of Walter Mitty's daydreams. For thousands of people it's a simple dream. They'd just like to make enough money to quit their job, to buy a small place in the country, and retire.

For many that dream is never realized, but for M. O. "Till" McCall, district supervisor of the Transylvania Soil Conservation District, the dream came true.

McCall was employed by the Southern Railway for 25 years, until his retirement in 1927. Soon after his retirement he moved to a farm in the mountains of Transylvania County, N. C., near Brevard. In doing so, he finally realized a dream that had remained with him for a quarter of a century after leaving the farm at age 17.

Today at 74 Mr. "Till," as he is affectionately addressed, is not physically able to farm as much as he once did. But he still farms some and operates a "country" store. His greatest pleasure, however, is serving as one of the supervisors of the Transylvania Soil Conservation District.

Note:—The author is information specialist, Soil Conservation Service, Spartanburg, S. C.

Mr. "Till" (right) converts customers to conservation on his country store porch.

Almost any time of the day he can be found seated in a cane bottomed chair on the porch of the store talking soil conservation to anyone who will stop and listen.

Mr. "Till" has some rather definite opinions about soil conservation and people who won't practice soil conservation, and he doesn't hesitate to express them. His "education" usually gets results.

One time though it took a heavy rain to "convert" a farmer who couldn't be persuaded to change his way of farming because he "remembered how his grandpa did it," as Mr. "Till" expressed it.

One day Mr. "Till" and his farmer-friend went to Brevard for some seed corn. On the way back with the seed, he relates, "We met my friend's fertilizer going to town in a swollen stream that was only half water. The other half was soil and last year's fertilizer."

"I pulled up on the bridge to call my friend's attention to this and give him a little friendly lecture. Just as we stopped, down the stream came an empty fertilizer sack that had washed out of a field where my friend had put out fertilizer just the day before.

"He has been strip cropping ever since," Mr. "Till" added with a twinkle in his eyes.

Mr. "Till's" farming today is mostly patch farming—a little corn, a vegetable garden, and a pasture. He started in 1930 with 104 acres but with encroaching age that was too much to take care of so he sold all but 16 acres. At 74 he's not quite as active as he once was—physically, that is. Mentally, he's as alert as a young man and, like a young man, he has the vision to see the need for the widespread adoption of soil and water conservation in Transylvania County.

"Mr. 'Till' is still active enough to attend meetings," says Harry Newland, Soil Conservation Service technician assigned to help farmers in the Transylvania Soil Conservation District. He visits farms, walks over them with me, and preaches the gospel of soil and water conservation as the salvation of mountain farming in Transylvania County.

He liked trees and profits so he started

Woodland Conservation

By MAX D. BOLAR

DID you ever "have your cake and eat it?" Arl Hildebrand of Prescott, Ark. did. In 1940 he started a woodland conservation program on 8 acres of his farm on which a dense stand of pine trees was growing. Because of the density of the stand, the trees averaged 9 inches in diameter at breast height even though they were over 30 years old. The soil in his woodland field was classified as capability Class III, therefore, capable of being used for pasture or row crops provided certain crop rotations were used. Also, it has a high suitability for wood crops.

Clear cutting the woods was quite a temptation when he was offered $300 for the timber. Where else could you get $300 for a crop that just grew up by itself, with no extra care? On the other hand, Arl knew that once he had clear-cut he would have quite a long wait for another woods like it. He talked with technicians of the Soil Conservation Service about his land use and conservation problems. They suggested that he use this field to grow a wood crop. He could do this very simply by keeping the best trees well spaced and thinning out the poorest. This amounted to giving trees "space to grow, but none to waste." They told him that probably he could make more money in the long run by using this field to grow trees than he could by using it for other crops.

Note:—The author is a woodland conservationist, Soil Conservation Service, Hope, Ark.

Arl Hildebrand's income from tree farming.

Year	Sawlogs		Pulpwood		Total Value
	Bd. Ft.	Value	Cords	Value	
1940	9,500	$104	54	$108	$212
1945	14,500	380	9	18	398
1950	3,500	135	6	18	153
1954	20,000	880	2	10	890
1957	19,600	910	4	20	930
Total	67,100	$2,409	75	174	$2,583

The 67,100 board feet of lumber cut from 8 acres means an average yield of more than 8,000 board feet per acre over the 17 year period. That is more than twice the amount he had when he started selective cutting. In addition, he harvested 75 cords of pulpwood. Moreover, he now has more standing timber than he had in 1940. He has received more than eight times as much money by selective cutting over the 17 year period as he would have received by clear cutting in 1940.

In addition to making money from his woods, Arl Hildebrand has developed into a good woodsman and is now a real tree farmer. Since the second cut he has marked his own woods and has done his own cutting, skidding, and hauling. He maintains that farmers are missing a good profit by not doing their own woods work.

Not satisfied with the original 8 acres, Mr. Hildebrand has planted over 100,000 pine seedlings during the past 10 years. He proposes to commence thinning his pine trees when they reach pulp size, which they do when they are 10 to 11 years old.

Part of Arl Hildebrand's 8 acres of timber that has produced more than $2,500 in 17 years.

Arl Hildebrand standing by one of the more than 100,000 pines he has planted.

Teamwork in Utah

When the West Fork of Grouse Creek in Utah needed a reservoir to supplement its water supply, repair of a water diversion and an improved irrigation system, everyone pitched in. SCS could not provide immediately all the engineering help requested by the West Box Elder Soil Conservation District so farmers hired private engineers to complete plans and specifications. The Utah Water and Power Board gave an interest free loan to cover part of the construction cost. ACP cost-sharing program helped. Mutual irrigation companies and other groups aided in varicus ways.

By TOM EVANS

Teamwork Spar

The Green's Lake watershed area above Cedar City, Utah, doesn't flood very often, but when it does it lets loose with some real rip-snorters.

For years the watershed, covering an area of about 10 square miles, has been cocked, primed, and aimed directly at Cedar City. Most floods that rolled down from the watershed were troublesome and damaging, but not nearly as costly as the one which swept down the mountain on July 26, 1956.

Like many American communities, Cedar City has been growing. Housing developments, streets, and public buildings have been built

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Note:—The author is area conservationist, Soil Conservation Service. Cedar City, Utah.

Pictures, starting upper left: Clearing pinyon-juniper trees in preparation for reseeding in Green's Lake Watershed . . . employee of Cedar City seeds Siberian wheatgrass . . . SCS engineer surveys site for debris basin . . . construction of concrete channel to carry flood water involved 42,750 yards of excavation . . . completed concrete section of flood channel required 810 cubic yards of reinforced concrete . . . man looks down completed emergency spillway . . . at ground breaking ceremonies are (left to right) Claude Urie, local contracting officer, Warren Bullock, chairman of watershed committee, William Thorley, supervisor of Iron County Soil Conservation District, and Ron Phillips, contractor's representative.

Watershed Project

on the flood plain and in the wide natural channel which used to let floods bypass the town with little damage. Damage to homes, streets, and farmland in the path of the 1956 flood was more than $100,000.

When the big flood hit, Cedar City's mayor declared a state of emergency. Men over 21 and all available equipment were pressed into service. For several days as storm clouds gathered over Green's Lake several smaller, damaging floods followed the devastating wake of the large one.

After the floods, local people took up the heartbreaking job of cleaning muck out of basements and salvaging rugs, furniture, furnaces, and electric household equipment. Streets and sidewalks had to be repaired, retaining walls replaced, basements pumped out, and plugged sewers cleaned out.

Once the cleanup job was done, the main thought in everyone's mind was, what would prevent the same thing from happening next week, next year, or 2 years hence? The mayor met with the City Council. Supervisors of the Iron County Soil Conservation District also gathered to discuss the problem. These meetings resulted in the organizations jointly sponsoring an application to the Soil Conservation Service and the State of Utah for a watershed protection and flood prevention project for the Green's Lake watershed.

The application was approved and the Soil Conservation Service commenced development of a work plan on January 22, 1957. Numerous obstacles appeared, many of which could only be overcome by action of the local people.

A watershed committe formed of representatives of the people, met often to tackle problems as they developed. Under the able chairmanship of Warren Bulloch and with the wholehearted cooperation of everyone concerned, the committee worked out each tough problem.

Here's what teamwork did for Cedar City: When test pits were needed, Cedar City hired a backhoe and furnished rodmen for preliminary surveys; Iron County Commissioners agreed to relocate a county road in a few places and the State Highway Department agreed to a floodway under U. S. Highway 91. One rancher agreed not to use that portion of his range for a period of 5 years. Another rancher moved his sheep herd off the watershed to another range which Cedar City leased for him. Other examples of local cooperation were numerous.

Just 2 months after planning commenced, the work was approved by the Governor and

sent to the Administrator of the Soil Conservation Service.

On April 22, 1957, the watershed project was approved and installation of the various works of improvement was under way.

The work plan called for installation of both land treatment and structural measures. Land treatment consisted of proper range use, clearing of brush and pinyon-juniper trees followed by drilling grass seed, airplane seeding of the entire watershed, and fencing. Much of this work was done during the summer and fall of 1957. ACP participated in cost-sharing on clearing, seeding, and fencing done by the ranchers. The Bureau of Land Management helped plan the land treatment measures on lands administered by them and have moved ahead rapidly with the land treatment measures.

For the structural works of improvement, additional surveys were needed and detailed designs had to be prepared. SCS personnel in Cedar City and the design section of the regional engineering and watershed planning unit worked hard and long to get these jobs done. The contracting local organization sent out preinvitation-to-bid letters to 135 contractors on December 16, 1957. Fifteen bids were received, and the contract was awarded to a contractor of Price, Utah, on January 28, 1958 for $181,606.

Structural measures consisted of three debris basins, two retention dams, and a floodway channel. The channel collects water from two main debris basins and a retention dam, and diverts it away from Cedar City on a nonerosive grade.

Just above Highway 91 the earth floodway channel leads water over a concrete drop structure into a concrete lined section where it is conveyed to the main retention dam. This dam will retain the water and release it at a controlled rate, bypassing Cedar City completely. When completed, the project, including Federal, municipal, county, and private costs will amount to $334,200.

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Nearly 7,000 of the 8,500 girls attending national Girl Scout Senior Roundup in Colorado last summer went through the conservation exhibit tent.

SCS to help in Radioactive Work

The Soil Conservation Service is preparing to assume new responsibilities, along with other agencies, for monitoring radioactive fallout on agricultural land and water and on stored and harvestable crops during emergency conditions.

SCS work unit personnel soon will be responsible for such measurements at 320 locations throughout the country and the number may increase later. Other agencies will collect similar facts at more than 600 stations for use of the Office of Civil and Defense Mobilization.

State soil scientists of SCS will attend one of three training sessions this fall where they will learn how to use radiation-monitoring equipment being provided by OCDM, and how to interpret the readings. Specially trained representatives of the Soil Conservation Service and Agricultural Research Service will conduct the training schools.

This activity is part of a longtime program being developed to carry out the responsibilities of agriculture in the field of National defense. Peacetime uses of atomic energy are being developed rapidly and the number of reactors being constructed will increase. The possibility of reactor accidents which would release radioactive materials is recognized.

In case of reactor accidents or war, SCS technicians and other agricultural scientists would need to understand and be able to explain to land operators the relationship between radioactive content of soil or water and land use, crop production, and the use and management of soil and water resources.

Such a program of monitoring fallout will be a regular part of a peacetime program in this atomic age because of the potential effect of radioactive materials on soils, water, crops, foods, and livestock. In the event of a war emergency, officials point out, this monitoring would be an important part of defense activities.

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Old Two-Toes was a famous wolf in Wisconsin. He had escaped guns, hunters, traps, and dogs for many years. Last year the bounty system was abolished and wolves placed on the protected list. Old Two-Toes promptly got run over by an automobile.

What Is A Conservation Farmer?

By NORTON STANGELAND

"CONSERVATION farmer" is becoming a more common term in everyday language. What does it mean? One good answer is found in the experience of J. Harvey Lyman.

Mr. Lyman lives 4 miles northeast of Grace City, N. Dak. He owns a 1,120-acre farm which he operates with the help of his two sons, Roger and Harvey, Jr., and his wife Lazetta. In addition he rents 160 acres of pasture.

The Lyman family first took over the farm as tenants in 1937. Previous operators had proved that the soil did blow. They had not farmed 200 acres of cropland for 2 years because of the danger of soil blowing. This was not the only farm in the community that was bothered with soil drifting. A nearby quarter section was so badly eroded that a man on horseback could hide in the blow-outs.

Lyman realized the need for drastic measures to control soil blowing on this farm. He began farming strips, laid out in 20 rod widths, in the spring of 1938. This strip farming, the first seen in the community, caused much amusement among local people. To quote Lyman, "People thought I was off my rocker when they saw my strip farming for the first time."

Lyman planted his first half-mile field shelterbelt in 1939 under the Prairie States Forestry Project. He planted his second half-mile in 1940 when he purchased the farm. Others in the community were observing the results of Lyman's system. Some began using similar practices on a small scale. Some needed encouragement.

Frank Johnson, then county agent, knew of Lyman's system of farming. He also knew that

Note:—The author is work unit conservationist, Soil Conservation Service, Carrington, N. Dak.

Norton Stangeland (left) and J. H. Lyman inspect wheat protected by field windbreak in background.

Purebred Herefords graze one of five pastures on Lyman farm, with stockwater dugout in foreground.

more farmers needed to do likewise. He began holding educational meetings that led to the organization of the Foster County Soil Conservation District in December 1944. It was only natural that Lyman be elected to the first board of district supervisors and chosen chairman. The board of supervisors manages the affairs of the district.

Lyman became cooperator number nine of the Foster County Soil Conservation District and worked out a basic conservation plan with the local soil conservation district. Soil Conservation Service technicians had been assigned to the district at the request of the supervisors. The first step was a soil survey of the farm and a land capability inventory. The soils proved to be mostly deep, very sandy, with very rapidly permeable subsoils.

In working out the basic conservation plan, Lyman reduced the strips of cropland from 20 rods to 15 and 10 rod widths. He decided on a crop rotation of corn, small grain, and grass and alfalfa for 4 or 5 years to help maintain fertility. Approximately 125 acres are in tame grass each year. Lyman applies commercial fertilizer and barnyard manure and leaves the stubble after the small grain harvest. Sometimes livestock graze the stubble but never long enough to expose soil to winter winds.

Field shelterbelts now total 4 miles and additional trees protect the farmstead and lots.

The amount of grass that grows each year determines the number of cattle allowed on the pastures. Livestock is allowed to eat about half the annual growth. Such a practice keeps the grass strong and enables it to produce more the following year. Three stockwater ponds properly placed in the pastures help distribute the grazing. More are planned.

Wildlife receives encouragement all over the farm. to quote Harvey, "I have lots of wildlife on my farm including deer, a variety of fur bearers, grouse, Hungarian partridge, and duck. I now have young duck on my stockwater ponds which I didn't have before."

All this has been made possible because Lyman works closely with his soil conservation district. The district has made available equipment, seed, planting stock, and labor. The Soil Conservation Service assisting the district has provided the technical assistance and know-how. Many of the conservation practices that Lyman has applied were done with financial help of the ACP cost-sharing program administered by the County Agricultural Stabilization Conservation Committee.

Conservationists focus attention on soil with

New Commemorative Stamp

The world's first commemorative soil conservation stamp is now helping carry the symbol of modern soil and water conservation throughout the United States and the world.

The three-color U. S. Postage stamp was first released August 26 at the annual meeting of the Soil Conservation Society of America in Rapid City, S. Dak.

The postmaster and his staff at Rapid City are glad that the rush is over. The top picture shows just part of the many thousands of first day covers (special envelopes) sent to the Rapid City Post Office to be mailed out under the new stamp. The first day covers are a choice item for stamp collectors. Viewing a few boxes of first day covers are Mrs. Don Ridley and Postmaster George Lampert, Rapid City. Mrs. Ridley is the wife of Rancher Don Ridley, operator of 1,500 acres near St. Onge, S. Dak., and cooperator with the Lawrence County Soil Conservation District.

Throughout the United States, organizations used the announcement of the new stamp to focus attention on soil and water resources and their importance to townspeople and industry as well as farmers and ranchers.

Many local soil conservation districts and state associations of districts arranged for use of the commemorative stamp on their newsletters or other regular mailings.

Local committees organized and conducted special ceremonies. Special displays in fair booths, windows, and lobbies were reported. In a soil conservation district in Texas merchants bought 10,000 stamps in one special ceremony. Pictures of local purchasers of the first stamp appeared in dozens of papers and on TV stations. Radio stations reminded people to buy.

In lower picture, Marlinda Mason, Miss Colorado for 1959, takes time out from her duties with Colorado State Department of Agriculture to help launch the new stamp. With her is Clarence Foster (left) president of the Colorado Association of Soil Conservation Districts and Ted Hefner, Denver Postmaster whose interest in commemorative stamps dates from his early rookie mail clerk days, discussing how to sell 1½ million soil conservation stamps through Denver's 34 branch postoffices.

Among the many organizations participating in various ways were local soil conservation districts, local, State, and Federal agricultural agencies, Postmasters, the National Rural Letter Carriers Association and its members, newspapers, magazines, radio, and television stations, civic clubs, and professional organizations, women's clubs, youth groups, industry and business organizations.

Unlike most commemorative stamps, this one honored no individual, place, or event. Rather it was designed as a tribute to the farmers and ranchers and their local soil conservation districts who have made modern soil and water conservation effective in keeping and using wisely the Nation's basic resources.

Likewise, it is a tribute to all who have helped farmers or ranchers and their districts to do the job.

Printing the 120 million stamps by the Bureau of Engraving and Printing in Washington required 10 working days, three 8-hour shifts per day, and about 17 tons of paper. Sheets of 200 stamps rolled off the presses at the rate of 2,000 sheets per hour.

The center picture shows L. Rohe Walter (left), Special Assistant to the Postmaster General, and Donald A. Williams, Administrator of the Soil Conservation Service, inspecting a sheet of stamps which has just come off the press.

New Hope for Delaware's flatlands—

Bear Hole Watershed Pay-Off

By GORDON SMITH

IN March 1959, the Bear Hole watershed project in Delaware was finished. Four months later a rainstorm hit the area with the intensity expected only once every half century. People who have lived there longer than that said they had never seen such a downpour.

Thirteen inches of rain fell in 6 days, July 10 to 15. Half of that fell between 2 a.m. and noon on July 15 after the earth had been saturated. The crop growing season was at its peak.

But Bear Hole watershed handled the deluge with an estimated crop damage of only $2,000. Farmers in unprotected areas counted up damages five times as great.

Scalding caused the damage. The corn and soybeans drooped when the sun hit the standing water.

The second day after the rain stopped, Bear Hole watershed farmers were in the fields on tractors. In wholly unprotected areas, farmers still were unable to get into their fields by August 3.

Flood reduction isn't the only benefit the Bear Hole watershed project has brought to the State.

"Farmland values around here have jumped 25 percent in 2 years." That's John McCabe speaking. He owns 75 acres of good corn and soybean land near Roxana.

A land boom? To the 120 farmers in the 4,523-acre Bear Hole watershed it amounts to the same thing, only better.

Bear Hole had the honor of getting the first approval in the United States under the Watershed Protection and Flood Prevention Act (Public Law 566) passed by Congress in 1954.

Note:—The author is information specialist, Soil Conservation Service, Upper Darby, Pa.

Dotted line shows boundary of 4,523-acre Bear Hole watershed. Main channel starts in top center, comes through middle and out near Johnson's Corner.

Contractors started moving dirt in September 1956, Thirty months later, they had licked a flooding and drainage problem that had troubled farmers since colonial days.

Though actually completed early in 1959, work was far enough along the year before to show monetary benefits.

McCabe explains, "Before we started this project our crops would do pretty well in a dry summer. But, if it was a wet one, most of us lost our crop."

Bear Hole, like much of southern Delaware, is flat and fertile. It's good cropland, but the problem has always been to get excess rain off the flat topography. Early colonizers removed excess water from their lands by forming organizations and digging community ditches with taxes in money or assessments of labor. Tax Ditches—as they are known today—still operate throughout Delaware agriculture.

Lacking power machinery, early work took years to complete. At best, the results were inadequate. Woodlands were hard to clear and ditch. Main channels were narrow and shallow. They silted up almost as fast as they were dug.

The CCC boys took their turn at a project in the Bear Hole Areas in the late 1930's. They completed a survey of the main channels, but World War II stopped further efforts. The local Tax Ditch became inactive. The main channel became silt-clogged and useless. Dropping farm economy after the war spoiled chances for improving it. Arch Hudson, Selbyville farmer located on the edge of the new main channel, recalls, "We'd have been out of business for good in less than 5 years the way things were going. I lost my corn crop almost every fall. The ditches just couldn't handle the rain."

When the new PL-566 Watershed Act became law, the State Soil Conservation Commission of Delaware took quick steps to bring this aid to Bear Hole. It applied for assistance and sponsored the project. The Bear Hole Tax Ditch was reorganized under new Delaware drainage laws and became the contracting organization.

The Bear Hole Tax Ditch negotiated a contract with the soil conservation district of Sussex County. In all, 29 miles of main outlet channel were constructed, including 19 prongs leading to it. Channels were punched through miles of dense woodland, a job considered impossible in bygone years. Spoil banks were leveled along the new channels and seeded with lespedeza by the State Fish and Game Department as a wildlife improvement measure.

Bear Hole watershed land is flat, fertile, and produces good crops if not flooded or waterlogged. The James Savage, Cora Long, and Jeanna Evans farms are among those benefitting from the watershed program.

As the new work was completed, farmers were able to improve their own farm drainage systems by tying into the prongs. Over 20 miles of farm drainage systems, designed by Soil Conservation Service technicians, have been established by farmers cooperating with the Sussex County Soil Conservation District.

Fields have changed shape to follow the new drainage pattern. Hedgerows are being removed and recently abandoned fields are again part of the farm operation. Crop rotation, cover cropping, stubble mulching, and land-smoothing measures are being used by farmers as part of the overall watershed protection plan. SCS technicians prescribe these measures to cut water runoff, reduce siltation of the new channels, and build soil fertility. Many of the farmers have planted wildlife food and cover plants along their field borders.

County ACP payments help farmers meet some of the expense. Costs of watershed improvements, such as main channel and prong ditch work, are shared by Federal, state and local funds. Local people paid about 17 cents of each dollar spent on the contract costs of improvements. The Tax Ditch is responsible for channel maintenance.

Farmers aren't the only ones benefiting from the watershed project. Floods no longer are a threat to homes in Roxana and Johnson's Corner. Improved channels keep high water off the roads. Flood damage repairs in the towns and on the roads will be reduced to a fraction of former costs.

Partly because of the success on the Bear Hole Area, a similar project is starting on the Upper Nanticoke Creek less than 20 miles away. The new project will cover 120,000 acres or one-fifth of Sussex County. It will take an estimated 10 years and $2¼ million to build over 350 miles of outlet channels. Thousands of farmers and numerous towns will be affected by this one project. Other watersheds in Delaware are applying for aid under Public Law 566. In the not-far-off future much of the state may be affected by the new watershed approach to conservation.

Bear Hole farmers are proud they led the way.

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Forty percent of the farmers produce 90 percent of our agricultural products.

Officials of 19 countries study U. S. watersheds

Thirty-two representatives of 19 countries are on an extended field trip to study watershed management programs and activities in the United States. The tour started with a seminar in Washington August 10 and will end October 5.

Participants scheduled to attend represent Argentina, Brazil, Burma, Chile, Ceylon, El Salvador, Greece, Honduras, India, Israel, Jamaica, Madagascar, New Zealand, Pakistan, the Philippine Republic, Sudan, Thailand, Turkey, and Venezuela. They include officers responsible for planning or directing agricultural and forestry programs.

The tour includes visits to watershed protection and improvement activities in Arizona, California, Colorado, Delaware, Georgia, Michigan, Mississippi, Nebraska, North Carolina, Ohio, Oklahoma, Pennsylvania, Texas, Utah, West Virginia, and Wyoming.

A number of Federal and local agencies are cooperating with the Food and Agriculture Organization of the United Nations in the seminar in conducting the event.

A lively interest in watershed management developing around the world led to the request for such a study. This approach opens up vast possibilities for raising living standards in under-developed countries as well as maintaining and expanding the energy and agricultural supplies of many of the economically developed countries, says FAO.

Grazing retards tree reproduction

Research at The University of Wisconsin indicates that grazing of farm woodlots reduces the plantfood available for reproduction of trees. Soil Scientists A. L. Leaf and S. A. Wilde state that such depletion of soil nutrients retards tree reproduction because topsoil serves as a natural seedbed for new trees.

The researchers analyzed tree litter from both grazed and ungrazed woodlots and topsoil around the trees. Plant food levels—calcium, phosphorus, potassium and nitrogen—proved to be lower on grazed plots.

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Many of us spend half our time wishing for things we could have if we didn't spend half our time wishing.—Alexander Woollcott.

DISTRICT PROFILE

WILLIAM A. HUNT of FLORIDA

I would call William A. "Bill" Hunt, president of the Florida Association of SCD supervisors, a character, except that the word character has come to mean an odd or eccentric person. What Bill is, is a unique and extraordinary person. He has a bluff, colorful personality, and a blunt way of speaking that startles people and puts them on the defensive at first. But soon they learn that it's just a coverup for a social conscience that he's reluctant to let people find out about.

His conversation is larded with jests, sophisticated humor, and plain cracker barrel philosophy. But when he starts talking about soil and water conservation, his conversation becomes serious and straight-forward and his personality undergoes a complete change. On first meeting Bill one might think he is not particularly interested in soil conservation or the district program. But he's deeply interested and he says that being state president and chairman of his local board is a pleasure instead of a task, and that he considers it a privilege to serve.

Bill Hunt owns his own plane and travels all over the Nation to conservation meetings. As a result he is keenly aware of the national soil and water conservation problem as well as the problems of Florida and the citrus industry. He has a thorough understanding of the soil conservation district program and how it can be used to solve these problems.

Bill has an inexhaustible fund of stories. One of his favorites concerns a fertilizer salesman from Jacksonville who called on him at the grove one day. After he'd been in the grove a while, the salesman asked Bill why his fruit was so clean and the foliage so green and shiny.

(In Florida, an orange on the tree has a rusty, scaly appearance and is entirely different looking from one that you buy at the supermarket after it has been cleaned and treated. That is, most places except at Bill's groves. There the fruit is clean and the leaves polished until they glisten.)

Bill Hunt, colorful, unorthodox citrus grower, ardent conservationist, and president of the Florida Association of Soil Conservation Districts.

Bill told the fertilizer salesman, "It's because I come down to the groves every morning with wax and a buffer and polish the leaves."

Knowing Bill's penchant for kidding, the salesman smiled politely and then said, "Really, Bill, why are the leaves so shiny?"

"Well seriously," said Bill, "it's because I keep snails that clean up the leaves and the fruit."

"Now I know you're lying," said the salesman.

I thought so, too, when H. G. Dasher, area conservationist at Marianna, told me the story, but I learned subsequently that Bill does indeed keep snails in his groves to clean up the fruit and the foliage.

This is just one example of Bill's unorthodoxy. Another is not spraying his groves. There hasn't been a spray wagon on his place in 10 years. A group of entomologists visited his grove and had to search hard to find a single bug. Near his place in a grove where the owner did spray the entomologists got a hatful of bugs including Texas mites, spotted mites, purple mites, and others.

Bill doesn't cultivate his groves either. Instead, he allows the native Florida vegetation, which grows lush in the State's subtropical climate, to grow until it's several feet high. Then he cuts it into the soil.

"I believe it's much better for the trees and for the land not to cultivate or spray," Bill says. "Production may not be as high. I'll grant you. Cultivation and spraying will probably stimulate the trees to produce more but at the same time production costs are greater. And when you look at the black figures at the bottom of the page, mine will be larger than most of those who spray and cultivate.

"Of course," he adds, "there are a thousand different ways of producing citrus. Every grove owner has a different way. And nearly all of them work, at least for a while, because trees want to grow and bear fruit.

His system apparently works. His trees are vigorous and healthy, the soil in his groves mellow and crumbly, and the citrus is first-quality fruit.

Besides practicing soil and water conservation in his own groves, Bill spends a lot of time working to interest farmers throughout Lake County in the district program. Although considerable progress has been made, about the only obvious practice to be seen in the groves is contouring and you don't see too much of that, he admits, because it's too expensive to pull up the old trees, which were set out in the conventional row arrangement, and replant them on the contour. Also grove owners believe the trees will do better when planted in straight rows up and down the slope for air drainage.

"But, by and large, we're making progress," he continued. "Where trees are killed by cold, more and more of the owners are replanting on the contour."

He says that there are 637,440 acres of land in Lake County and only 120,000 acres in groves, so there's plenty of land where conservation is in use and apparent.

These practices include cover cropping, drainage, irrigation, wind stripping, tree planting, well construction, farm ponds, and mulch farming.

One important practice gaining in popularity is the use of pasture for feed and forage reserves. Farmers employing this practice keep their cattle off a pasture for a certain length of time, then mow it for hay or silage, or leave the pasture for winter grazing.

Another important conservation practice steadily growing in favor is planting cover crops in groves—oats, rye, or blue lupine—not only for soil improvement but for wind-erosion control in the spring.

The day after I visted him, I was in the State office talking with Colin Gunn and Hamp Dasher about the events of the previous day. After Dasher had told several stories about him, Gunn said, "You're going to make a legend out of Bill Hunt."

Dasher replied, "He's already one."

Whether he is or not, he's many things—raconteur, bon vivant, sportsman, and conservationist. And I daresay that of the four, he'd rather be known as conservationist.

—LEON J. SISK

Working Together

Representatives of the Soil Conservation Service and officials of the National Association of Soil Conservation Districts have prepared a joint program of action for maintaining and improving working relations between SCS and local soil conservation districts. Each organization is distributing the program to its own people. The document outlines responsibilities, objectives, problems, and working principles.

"Important as these relationships are at State and National levels," the Foreword states, "the effective operation of the soil and water conservation program is finally achieved by people working together in a local soil conservation district."

New facts on winter hardiness

Recent tests at the University of Wisconsin indicate that winter-hardiness of red clover and alfalfa hinges on such factors as when cold weather strikes, carbohydrate levels in roots and crowns, and even soil fertility.

Levels of soil phosphorus and potassium influence cold resistance. The plant is better able to withstand cold when plenty of these nutrients are in the soil.

Cold resistance increases from September to about mid-December and plants are best able to resist cold from mid-December until early February.

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SCS published 37 soil survey reports, mostly on a county basis, for areas in 22 states, last fiscal year.

FUNDAMENTALS OF ECOLOGY. By Eugene P. Odum, in collaboration with Howard T. Odum. 546 pp. Illus. 2d Edition. Philadelphia and London: W. B. Saunders Co. $7.50.

THE art of soil and water conservation, as practiced by the Soil Conservation Service, brings to bear on each land area all the diverse technologies that can help to analyse and solve its land use and conservation problems.

In the same way, the science of ecology, as presented in Odum's *Fundamentals of Ecology*, calls upon all the basic sciences that can help to explain the natural phenomena of life and its physical environment. Such a composite science provides a logical basis for the technology of conservation.

This is the second edition of Odum's book. The first appeared in 1953. Its functional approach to the subject and its logical organization won it ready acceptance as a general text in ecology. Increasing interest in the subject and expanding horizons of science and technology since that time have prompted an early revision of the book.

The changes are mainly additions of new material. Especially noteworthy is the chapter on the entirely new subject of radiation ecology. New paragraphs and sections are interspersed throughout the text.

The unique organization of the book aids the reader to understand the subject even though this may be his first introduction to it. The three major divisions are devoted in order to theory, description, and application.

Part I, the longest, sets forth the fundamental principles of ecology. Each concept is presented first as a concise summary *statement*, then elaborated in an *explanation*, and illustrated by *examples*. Some fifty separate ideas are given this treatment under the following general headings: (a) the ecosystem and biogeochemical cycles, (b) energy in ecological systems, (c) limiting factors, (d) species populations, (e) interspecies populations, and (f) biotic communities.

Whereas Part I deals with function, Part II deals with structure of ecosystems (i.e., living organisms of an area and their physical environment). It describes the principal habitats of the world and their biotic communities. In this way it illustrates with concrete examples how the principles stated in Part I operate in freshwater, marine, and terrestrial environments.

Part III is concerned with the application of ecologial principles to practical matters. Heading the list is conservation. According to the author, the aim of conservation is not "hoarding" for the future but "to insure a continuous yield of useful plants, animals, and materials, by establishing a balanced cycle of harvest and renewal." The ecosystem, he says, is the basic and most important principle underlying conservation.

The chapter on radiation ecology reviews nuclear concepts and terminology and gives information on the comparative sensitivity of organisms to radiation and the fate of radioactive materials in the environment. It discusses the new problems of fallout and waste-disposal.

The final chapter considers the relation of the growing human population to natural resources. The author finds considerable reassurance in the principles of ecology which suggest that ecological systems, including human population, are subject to self-activating controls. Knowledge of these principles will enable man to manage and use natural resources more wisely. But, he warns, man is a part of these systems; he did not create them and he cannot live independently of them.

—BEN OSBORN

SOIL CONSERVATION WORKBOOK. 48 pp. Illus. 1959. Danville, Ill.: Interstate Printers and Publishers, Inc. 75¢.

THIS is a text-workbook containing nine chapters with a bibliography listing 11 titles. It is well organized and profusely illustrated. Each chapter has blank spaces for problem-solving and for answering questions related to the text. Instructions and illustrations on how to set up classroom and field demonstrations, and observations to be made, are complete

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and simple enough for the do-it-yourself advocate.

The text briefly covers the fundamentals of man's dependence on the soil, how soil is formed, kinds of soil, plant foods, soil moisture, and erosion and its control. A chapter on THE GOVERNMENT AND SOIL CONSERVATION gives a brief account of soil conservation districts and how technicians of the Soil Conservation Service work with farmers to conserve soil and water.

The workbook will be valuable as a study unit in soil conservation or as a supplementary teaching aid. It may be used both in science and social-studies classes, grades 5 to 9.

Leaders and members of youth organizations such as Boy Scouts, Girl Scouts, Camp Fire Girls, and 4-H Clubs will find the workbook helpful in carrying out their conservation objectives.

Much of the information contained in the workbook is related to the 56-page book, *This Is Our Soil*, by Ernest D. Walker and Albert B. Foster, published by Interstate and available at 50¢ per copy.

—ADRIAN C. FOX

Marion (Ohio) Soil Conservation District supervisors are sponsoring the photographing from the air of tile systems on district cooperators farms during final installation to provide permanent record of tile line locations.

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A study of longtime relationships of crop yields to climate and soil types in the Great Plains is underway.

Dennis the Menace rediscovers dirt

The Soil Conservation Society of America has announced the publication of a new cartoon-type booklet, DENNIS THE MENACE AND DIRT. Through 20 pages of color cartoon-type strips, the famous little Dennis rediscovers dirt, which he already dearly loved, and is astounded at what his parents tell him about its importance. As a result, Dennis becomes an ardent conservationist in a way which will not bring joy to any mother's heart.

Hank Ketcham, creator of the lovable character, and his staff, planned the booklet with representatives of the society to help bring home the story of soil and water conservation. This is the first time Dennis has appeared in any form other than his regular comic strips and cartoons.

Mr. Ketcham is a cooperator with the Carmel Valley Soil Conservation District. He has a conservation plan in operation on his 61-acre ranch in Carmel Valley, Calif., developed with the help of Soil Conservation Service technicians.

Ketcham's program included reseeding of pastures, rotation grazing, woodland management, an irrigation system, more legumes, and a 1-acre pond stocked with trout.

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The South Dakota Agricultural Extension Service has published a revised edition of its circular, ORGANIZING WATERSHEDS IN SOUTH DAKOTA.